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25 (amended). A monoclonal antibody or recombinant antibody fragment which binds a human gamma-carboxylated osteocalcin fragment, wherein said human gamma-carboxylated osteocalcin fragment is selected from the group consisting of

consisting of 1. amino acids

i) a fragment which spans from amino acid in position 7 to amino acid in position 30 of the amino acid sequence set forth in SEQ ID NO:2 in which all three glutamic acids in positions 17, 21 and 24 of said sequence are gamma-carboxylated, and

ii) a fragment which spans from amino acid in position 6 to amino acid in position 30 of the amino acid sequence of SEQ ID NO:2 in which all three glutamic acids in the positions 17, 21 and 24 of said sequence are gamma-carboxylated,

and wherein said monoclonal antibody or recombinant antibody fragment has the specificity to epitopes that have been identified on said gamma-carboxylated fragment of osteocalcin.

26 (amended). A non-competitive immunoassay for quantitative determination of a gamma-carboxylated osteocalcin fragment in a sample comprising contacting the sample with two monoclonal antibodies or recombinant antibody fragments which bind said gamma-carboxylated osteocalcin fragment, measuring bound monoclonal antibody or recombinant antibody fragment, and comparing said amount with an amount measured in a sample having a known quantity of said gamma-carboxylated osteocalcin fragment, wherein said gamma-carboxylated osteocalcin fragment is selected from the group consisting of

i) a fragment which spans from amino acid in position 7 to amino acid in position 30 of the amino acid sequence set forth in SEQ ID NO:2 in which all three glutamic acids in positions 17, 21 and 24 of said sequence are gamma-carboxylated, and

ii) a fragment which spans from amino acid in position 6 to amino acid in position 30 of the amino acid sequence of SEQ ID NO:2 in which all three glutamic acids in the positions 17, 21 and 24 of said sequence are gamma-carboxylated, and

G1 wherein said monoclonal antibody or recombinant antibody fragment has the specificity to epitopes that have been identified on said gamma-carboxylated fragment of osteocalcin.
